

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



(43) International Publication Date
27 January 2005 (27.01.2005)

PCT

(10) International Publication Number
WO 2005/008204 A1

(51) International Patent Classification⁷: G01L 5/00, G01M 13/04

(21) International Application Number: PCT/NL2004/000516

(22) International Filing Date: 16 July 2004 (16.07.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data: 1023948 18 July 2003 (18.07.2003) NL

(71) Applicant (for all designated States except US): AB SKF [SE/SE]; Hornsgatan 1, SE-415 50 Göteborg (SE).

(72) Inventors; and

(75) Inventors/Applicants (for US only): MOL, Hendrik, Anne [NL/NL]; Rijksstraatweg 54, NL-4254 XG Sleenwijk (NL). VAN NIJEN, Gerrit, Cornelis [NL/NL]; Lemoenappelhof 7, NL-4021 VE Maurik (NL).

(74) Agents: VAN WESTENBRUGGE, Andries et al.; Nederlandsch Octrooibureau, Scheveningseweg 82, P.O. Box 29720, NL-2502 LS The Hague (NL).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

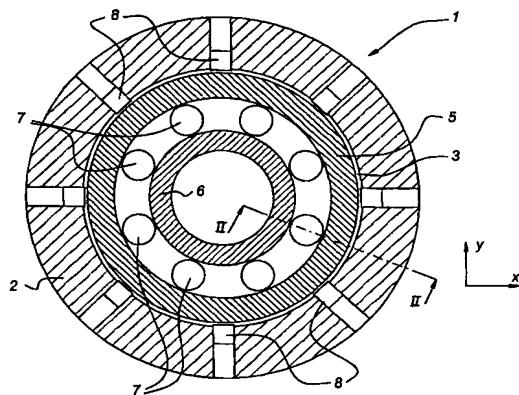
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD AND SENSOR ARRANGEMENT FOR LOAD MEASUREMENT ON ROLLING ELEMENT BEARING



WO 2005/008204 A1

(57) Abstract: Method and sensor arrangement for determining a contact force vector acting on a rolling element bearing (1) in operation. Sensor signals are received from a plurality of sensors (8) measuring performance characteristics of the rolling element bearing (1). The received sensor signals are processed to determine the contact force vector. The plurality of sensors (8) are arranged to measure a bearing component deformation, and the step of processing comprises the step of determining the contact force vector using an inverse transformation of a finite element analysis model which describes the rolling element bearing (1). The finite element analysis model is simplified using at least one generalised mode shape, the at least one generalised mode shape being a mathematical description of a natural mode deformation of a component of the rolling element bearing (1), such as the inner or outer ring (5, 6).